

## INNOVATIVE RESTRICTED COMMUNICATIONAL OPTIONS FOR AUTOMATED CODING IN AN ONLINE HUMAN-HUMAN COLLABORATIVE PROBLEM SOLVING INSTRUMENT

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Technology offers numerous advantages for the field of educational testing. One of them is automatic data coding. Collaborative Problem Solving (CPS) is a core competence in the 21<sup>st</sup> century, so its constant diagnosis is inevitable in educational context (Griffin & Care, 2015; OECD, 2017). Emerging interactions within a CPS instrument contain key information in terms of the test takers' competence. Automatic coding is quite problematic in this case, because content analysis cannot be implemented with the complete elimination of human raters. To solve this problem, previously one effective solution had been used: to allow students to communicate with each other only via a set of predefined messages. However, this solution has proved to be rather frustrating because of its inflexibility (Chung et al., 1999; Krkovic et al., 2016; OECD, 2017; Rosen & Foltz, 2014). In our research we are developing a CPS instrument in which restricted communication is applied in various innovative ways beyond predefined messages, to be able to provide more flexible options for communication. The aim of this study was to find out whether students can solve the problems via the restricted communication options and to explore their attitudes toward them. Ten 7<sup>th</sup> grade students, overall 5 pairs solved the two-problem online CPS test via the eDia platform (Molnár, 2015). The instrument was based on the MicroDYN approach (Greiff & Funke, 2010; Greiff et al., 2013; Molnár, 2016). The knowledge acquisition and application phases of the originally individual problem solving test items were transformed into collaborative and interdependent tasks. Beyond the exchange of predefined messages, students could also exchange images of the actual state of the variables available for them. Students were allowed to type in their own messages but they were instructed to do so only in case they could not express themselves by the restricted options offered. In the first part of the two-lesson data collection, students solved an individual test of 5 MicroDYN problems. In the second part, the CPS test was provided, followed by a questionnaire which contained seven 5-point-Likert-type items and one open-ended question to explore students' attitudes toward the CPS instrument. The test was found quite time-consuming, and none of the pairs completed all tasks. In the first problem, only 13.7% of the interaction in the knowledge acquisition and 12.5% in the knowledge application phase was realized through freely composed messages between team members, so the restricted options seemed to cover the communication needs quite fairly. Students reported they enjoyed the test and they found the options for communication appropriate. Our CPS test with its innovative solutions for restricted communication was found challenging but solvable in general, and had a good reception in its first trial. One main conclusion is that more time should be provided for the test in the future. The content of the free message interactions is a basis of developing further necessary predefined messages.

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